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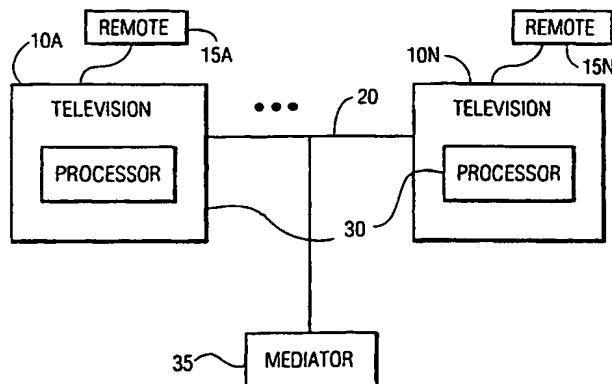
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: IN-HOUSE TV TO TV CHANNEL FORWARDING



WO 01/45396 A1

(57) Abstract: A method and apparatus for providing peer-to-peer communications between televisions wherein content identifying information is sent from any of the televisions (a sending TV) to any other of the televisions (a receiving TV). The content identifying information is information that identifies content currently watched on the sending television including samples of the currently watched content. In operation, each television is first identified to each other television. The identifying information includes determining whether a given receiving TV may convey content identifying information from each sending TV. In some instances, the receiving TV may only be programmed to convey certain types of content identifying information from the sending TV. The identifying of the television is performed by either the televisions or a mediator that is separate from each of the televisions. The televisions receive a receiving compliance status identifying what content identifying information is conveyed from a given sending TV. The televisions may receive the receiving compliance status from users of the televisions. The televisions first determine whether a given user may program or reprogram the content identifying information that may be conveyed from a given sending TV by requesting identifying information from the user such as a password. When a user does not have a proper password, the television will not allow programming and/or reprogramming the content identifying information a given sending TV may send.

In-house TV to TV channel forwarding

This invention generally relates to a method and apparatus for sharing audio visual content. Particularly, this invention relates to a method and apparatus for connecting two or more televisions together to share identifying information about viewed audio visual content.

5

As network connections, such as those using local area network (LAN) protocols, standardize and the setup and use of the network connections becomes simple for an ordinary consumer, more network connections will show up in consumer settings. At this 10 time, there are numerous standards that are vying for acceptance for consumer network connections. These network protocols include home audio-video interoperability (HAVI), home application programming interface (HAPI), IEEE 1394 serial bus interface (firewireTM, I-LINKTM, etc.), Home Phoneline Networking Alliance (Home PNA), BluetoothTM, cable network protocol systems, as well as other manners of proprietary wired and wireless 15 protocol systems. Much of the current focus on network connections is for the in-home network. Manufacturers are currently retrofitting every type of home appliance, from toasters to heating and cooling systems, for connection to an in-home network. Most of these systems are designed with a master/slave operability in mind. For instance, many systems are designed wherein a master controller, such as a television (TV) is provided with the 20 capability to recognize and control a slave device, such as a video cassette recorder (VCR). In this model, the master sends command and control information to the slave and the slave complies with the commands and sends status information back to the master. In similar systems, the master controller may be separate from the TV. In these systems, the TV acts as a display for the master controller and may also act as a command input for the master 25 controller.

Another example of such a system is shown in Japanese Patent Publication Number 10248020A, to Hiyoshi ("Hiyoshi"). In Hiyoshi, two TV's are connected together in a master/slave configuration for the purposes of enabling a parent at a master TV to monitor what is being viewed by a child on a slave TV. In operation, the master TV receives the

image data being viewed on the slave TV and displays the data on a corner part of the master TV display. However, this setup does nothing to enhance the viewing experience and does not promote a community experience as may be desired by a "connected" household. In addition, the received signal is always available on the master TV and therefore does not 5 reflect the desires of the child on the slave TV to illicit attention of the parent to any particular viewed content.

In another prior art system shown in U.S. Patent No. 5,490,208, to Remillard, a TV-to-TV connection via a phone line is utilized for facilitating a teleconference-like interaction. Each TV in the system is provided with a device that has speakerphone capability 10 and can initiate a call to another TV that is provided with a similar device. After initiation of a voice mode, the users may switch to a data mode wherein image data may be exchanged. The system may switch back and forth between the modes. However, this system is proposed for adding functionality to a TV that is not related to the primary viewing function of a TV.

In a typical household, two or more separate rooms in the household have a 15 TV. Oftentimes, a first household member may be watching the TV in a first room and may suddenly wish to indicate to a second household member in a second room the content being watched by the first household member. A husband may wish to convey to a wife in an other room to switch to an interesting current program. However, the only methods currently 20 available to convey this information from one party to another is to have the conveying party get up and tell the other party to switch channels or to have the conveying party shout out between rooms to the other party.

Accordingly, it is an object of the present invention to provide a method of sharing content identifying information within a TV viewing community.

25

An apparatus in accordance with the present invention provides for peer-to-peer communications between televisions wherein currently viewed content identifying information is sent from any of the televisions to any other of the televisions. The content identifying information may include samples of the currently viewed content, may include a 30 request to switch viewing to the currently viewed content, and/or may contain control information to switch either a primary or secondary (e.g., picture-in-picture) display to the currently viewed content etc. Accordingly, the term content identifying information as utilized herein should be understood to include any portion or all of the above. In addition, the term content identifying information should be understood to include other types of

content identifying information including current channel tuning information, current channel audio information, and other known types of information that may be conveyed about currently viewed content.

In operation, each television is first identified to each other television. The 5 identifying information may include information as to whether each of the given televisions is programmed to convey to a user content identifying information from each other of the televisions. The television receiving content identifying information (the receiving TV) may be programmed to convey all content identifying information from the television transmitting content identifying information (the sending TV). Alternatively, the receiving TV may be 10 programmed to convey no content identifying information or only certain types of content identifying information from the sending TV. Either the televisions or a mediator that is separate from each of the televisions may perform the identifying of each of the televisions.

In some embodiments, the receiving televisions may only be programmed or reprogrammed by authorized users. In these embodiments, the receiving televisions may first 15 determine whether a user is authorized to program or reprogram the receiving television to convey content identifying information. This may be determined by the receiving television requesting identifying information from the user. The user identifying information may include a password. When a user does not have a proper password, the receiving television will not enable the user to program or reprogram the content identifying information that may 20 be conveyed by a given other television.

The following are descriptions of embodiments of the present invention that when taken in conjunction with the following drawings will demonstrate the above noted 25 features and advantages, as well as further ones. It should be expressly understood that the drawings are included for illustrative purposes and do not represent the scope of the present invention.

30 The invention is best understood in conjunction with the accompanying drawings in which:

FIG. 1 shows an illustrative peer-to-peer TV system in accordance with an embodiment of the present invention;

FIG. 2 shows an illustrative peer-to-peer TV system in accordance with an alternate embodiment of the present invention; and

FIG. 3 shows a flow diagram of a process in accordance with an embodiment of the present invention.

FIG. 1 shows a peer-to-peer television system in accordance with an embodiment of the present invention. As shown, televisions (TVs) 10A, ..., 10N are interconnected via a bi-directional connection 20. The connection 20 may be any system for interconnecting devices that is capable of supporting bi-directional communications including an Internet connection, a local area network (LAN), an in-home network, etc. In this embodiment, the TVs 10A, ..., 10N each contain a processor 30 for operating in accordance with this invention. FIG. 2 shows another embodiment of the present invention wherein processors 30A, ..., 30N are separate from TVs 10A, ..., 10N. In either of the embodiments shown in Figs. 2 and 3, the processors 30 operate similarly.

FIG. 3 shows a flow diagram that together with Figs. 1 and 2 will illustrate a particular operation in accordance with an embodiment of the present invention. In operation, sometime after the TVs 10A, ..., 10N are interconnected, any of a registration system, query system, mediation system, etc., may be utilized for identifying the TVs 10A, ..., 10N to each other TV as shown in act 40. During the identification process, at least one of a mediator 35, and each of the processors 30 is provided with identifying information for each of the TVs 10A, ..., 10N. In addition, at least one of the mediator 35, and each of the processors 30 may be provided with information on the transmission capabilities of the connection 20. For example, any of the currently existing connecting systems are sufficient for the transmission of control information and some content identifying information. However, a higher transmission capability may be required to support transmission of a sample of currently viewed content as described in more detail below. Further, at this time or some future time, at least one of the mediator 35, and each of the processors 30 may be provided with information as to whether a given receiving TV may convey content identifying information from a given sending TV as described in more detail below.

In act 50, sometime after at least two of the TVs 10A, ..., 10N are identified each to the other, a user of one identified TV (a sending TV) may request the processor 30 of the sending TV to transmit content identifying information to the processor 30 of another identified TV (a receiving TV). This may be accomplished through the use of a remote

control 15, through direct input on the sending TV, or through other known methods of inputting control information to the sending TV.

The transmission may include current channel tuning information of the sending TV as well as other content identification information of currently viewed content.

5 As an example, content identification information may also include an audio, video, and/or text message input from the user of the sending TV. The audio, video, and/or text message may relate to the content currently viewed on the sending TV or may be other related information. The content identification information may also be audio, video, and/or text message directly from the sending TV such as audio, video, and/or text message relating to
10 the sending TV's current channel and content name. This information is readily available to each of the TVs 10A, ..., 10N, and/or the TV's processor 20, for example, that operate in compliance with Advanced Television System Committee (ATSC) standards, as well as other analog and digital systems and standards. This information may also be readily available to the sending TV's processor 20 wherein the sending TV has access to electronic program
15 guide (EPG) data.

In addition, in a case wherein the connection 20 can support it, the transmission may include a current content sample from the sending TV. The content sample may include single or multiple frames of currently viewed content depending on the capabilities of the connection 20 and the intent of the user of the sending TV. The single or
20 multiple frames may be transmitted utilizing any known system for transmitting similar data types, such as an MPEG compliant transmission, etc.

In act 60, the processor 30 of the receiving TV determines the receiving compliance status of the sending TV. The receiving compliance status is an indication whether the receiving TV is programmed to convey, to a user of the receiving TV, the content identifying information of a given sending TV. In a case wherein the receiving compliance status indicates that the receiving TV is programmed to convey the content identifying information from the given sending TV, the receiving compliance status may also indicate what particular types of content identifying information may be conveyed.

There are many instances wherein the receiving TV user will not want the receiving TV to convey a portion or all of the content identifying information from given other sending TVs. For example, in a case wherein a receiving TV user may choose to not be interrupted by a sending TV that belongs to an unknown party. During a later time, the receiving TV user may wish to reprogram the receiving compliance status to convey content identifying information if the receiving TV user determines that the user of the sending TV is

a known party. Accordingly, the receiving compliance status may be provided by a receiving TV user and may be programmed and/or reprogrammed freely or may only be programmed and/or reprogrammed after the receiving TV user complies with a security restriction.

In some embodiments, a user of the receiving TV may be required to comply with the security restriction, such as entering a password, prior to being allowed to programmed and/or reprogrammed the receiving compliance status. In this way, a party without the proper password, such as a television service technician, may be deterred from programming and/or reprogramming the receiving compliance status of the receiving TV. The receiving compliance status of the receiving TV may default to conveying content identifying information from each of the TVs 10A, ..., 10N, or may default to not conveying content identifying information from each of the TVs 10A, ..., 10N. In an other embodiment, the receiving TV may require user input to determine the receiving compliance status for each of the combination of the identified TVs 10A, ..., 10N.

In yet other embodiments, the receiving compliance status may be programmed and/or reprogrammed to convey certain types of content identifying information. For example, the receiving compliance status may be programmed and/or reprogrammed such that a receiving TV may convey channel-tuning information from a sending TV. However, at the same time the receiving compliance status may be programmed and/or reprogrammed such that a receiving TV will not convey (e.g., act on) control information to set the receiving TV to the channel of the sending TV. When the receiving compliance status is set to not convey or not convey all sent content identification information from a given sending TV, the processor 30 of the receiving TV may send to the sending TV an indication of the allowed content identification information. In an other embodiment, the processor 30 of the receiving TV may simply convey (e.g., display) any, if at all, allowed content identifying information received from a sending TV.

In act 70, when the receiving compliance status is set to convey some content identifying information from a sending TV, the processor 30 of the receiving TV responds to the content identifying information. For example, in a case wherein the content identifying information includes samples of the sending TV's currently viewed content and the receiving compliance status is set to convey the samples, the receiving TV will suitably convey the content samples. The content samples may include a video frame, multiple video frames, audio content, and other content samples, including a combination of the above content samples. When the content sample includes a video content sample and the receiving compliance status is programmed to convey the video content sample, the video content

sample may be displayed on a primary or secondary (e.g., picture-in-picture) display. In a case wherein the content identifying information includes multiple frame samples of the currently viewed content and the connection 20 may support it, then the processor 30 of the sending TV may begin transmitting frame samples to the receiving TV while sampling further frame samples.

The content identification information may include a control signal to switch the receiving TV to the sending TV's currently viewed content. The sending TV determines the type of content identifying information that is sent to the receiving TV. However, as discussed above, the receiving TV determines the receiving compliance status for a given sending TV. For instance, the sending TV may send content identifying information that requests the receiving TV to change a primary display to the sending TV's currently viewed content channel. However, the receiving compliance status may be set to accept content identifying information (control information) to set the picture-in-picture display and not the primary display. In this case, the receiving compliance status may be set to control the picture-in-picture display, to display the channel tuning information, etc., but not to allow control of the primary display.

It should be noted that since the TVs 10A, ..., 10N operate in a peer-to-peer mode, any receiving TV that is enabled to convey content identifying information from a sending TV, will convey the content identifying information. Accordingly, a TV viewing community of the TVs 10A, ..., 10N is provided by a system in accordance with the present invention.

Finally, the above-discussion is intended to be merely illustrative of the invention. Those having ordinary skill in the art may devise numerous alternative embodiments that are within the scope of the present invention without departing from the spirit and scope of the following claims. For example, in step 60 above, although it is stated that the processor 30 of the receiving TV determines the receiving compliance status of the sending TV, clearly the mediator 35 may perform this act. In fact, in other embodiments the mediator 35 may be responsible for other portions or all of the above-described system attributed to the processor 30. In these embodiments, the processor 30 and the TVs 10A, ..., 10N may merely present a user interface to the user for setting the receiving compliance status and for sending content identifying information.

In addition, the connection 20 may represent a connection that exits a house (e.g., an Internet connection) as described above. Accordingly, clearly an apparatus in accordance with the present invention may provide anyone connected to the connection 20

(e.g., anyone on the Internet) with the ability to "forward" content identifying information to anyone else's TV as long as the receiving compliance status of the receiving TV is not violated. In this way, relatives and others may forward content identifying information to a receiving TV. With permission (e.g., a properly programmed receiving compliance status), a service provider or other may send content identifying information as an advertisement for currently available content. Users may be paid by the parties sending the content identifying information in exchange for the users setting the receiving compliance status to allow content identifying information to be conveyed from a given sender.

Further, since the mediator 35 may be connected to a connection 20 that exits a household, clearly the mediator 35 may be external to the household. In this way, the mediator 35 may reside at a web site. The TVs 10A, ..., 10N may be provided with a unique TV identification number for the purposes of communicating with the web site. The web site may operate to provide a chat-like community for TV users. In this way, TV users within the community may make TV watching suggestions to others within the community. Users may be interested in participating in the chat-like community to find out what other users are currently watching. Other combinations of systems may also be suitably utilized without departing from the spirit and scope of the following claims.

In interpreting the appended claims, it should be understood that:

- a) the word "comprising" does not exclude the presence of other elements or acts than those listed in a given claim;
- b) the word "a" or "an" preceding an element does not exclude the presence of a plurality of such elements;
- c) any reference signs in the claims do not limit their scope; and
- d) several "means" may be represented by the same item or hardware or software implemented structure or function.

CLAIMS:

1. A television comprising:

a connection (30) configured to be operatively coupled to a connection of an other television (10); and

5 a processor (30) configured to provide content identifying information to the other television (10) and configured to control conveyance of content identifying information if content identifying information is sent from the other television (10).

2. A communication system comprising a plurality of televisions (10)

interconnected together, wherein said televisions (10) are configured to provide content

10 identifying information to others of said plurality of televisions (10) and are configured to control conveyance of content identifying information from said others of said plurality of televisions (10).

3. The communication system of Claim 2, wherein each of said plurality of

15 televisions (10) is configured to receive receiving compliance status information identifying the receiving compliance status of each other of said plurality of televisions (10).

4. The communication system of Claim 3, wherein each of said plurality of

televisions (10) is configured to receive identifying information from a user prior to enabling 20 the user to do at least one of program and reprogram said receiving compliance status information.

5. The communication system of Claim 3, wherein each of said plurality of

televisions (10) is configured to convey any content identifying information from other

25 televisions that does not violate the receiving compliance status of each of said plurality of televisions (10).

6. A method of providing communications between a plurality of televisions, said method comprising:

- a. sending content identifying information from any of said plurality of televisions (10) to any other of said plurality of televisions (10), and
- b. controlling conveyance of said content identifying information at said any other of said plurality of televisions (10).

5

7. The method of Claim 6, comprising identifying each of said plurality of televisions (10) to each other of said plurality of televisions prior (10) to act a.

8. The method of Claim 7, wherein said identifying comprises identifying a 10 receiving compliance status between each of said plurality of televisions (10).

9. The method of Claim 7, wherein said identifying is performed by a mediator (35) that is separate from each of said plurality of televisions (10).

15 10. The method of Claim 6, comprising identifying a receiving compliance status of said any of said plurality of televisions (10) that sent the content identifying information prior to performing act b and not conveying said content identifying information if said content identifying information violates said receiving compliance status.

20 11. The method of Claim 10, comprising receiving said receiving compliance status of said any of said plurality of televisions (10) from a user of said any other of said plurality of televisions (10).

25 12. The method of Claim 11, comprising requesting user identifying information prior to receiving said receiving compliance status and not programming said receiving compliance status if programming said query compliance status violates access rights of said user.

30 13. The method of Claim 10, wherein said content identifying information includes control information to change a display of said any other of said plurality of televisions (10).

14. The method of Claim 10, wherein said content identifying information includes channel tuning information indicating a currently viewed channel of said any of said plurality of televisions (10).

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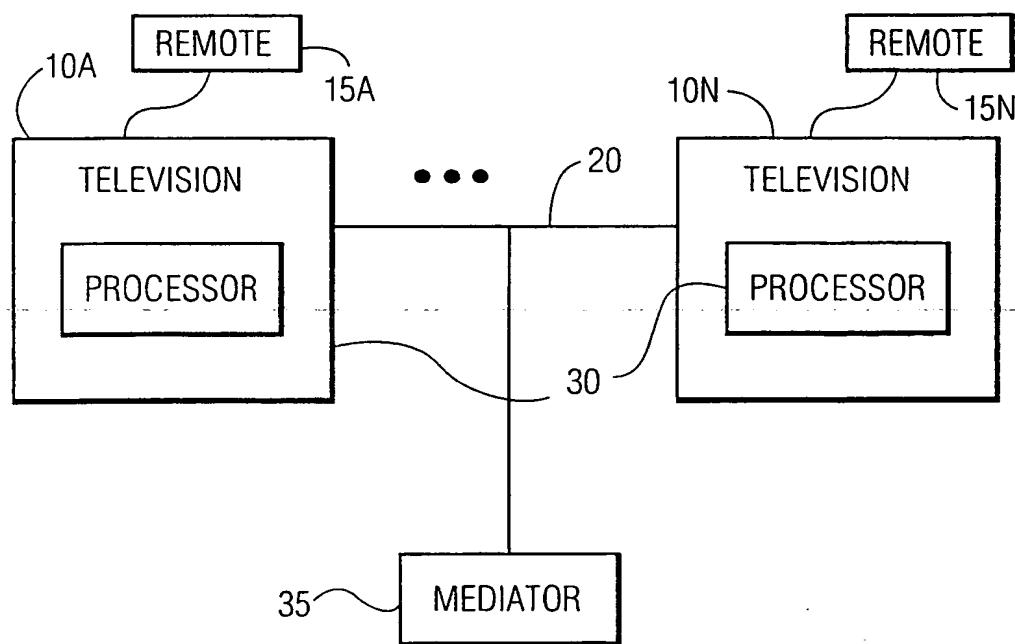


FIG. 1

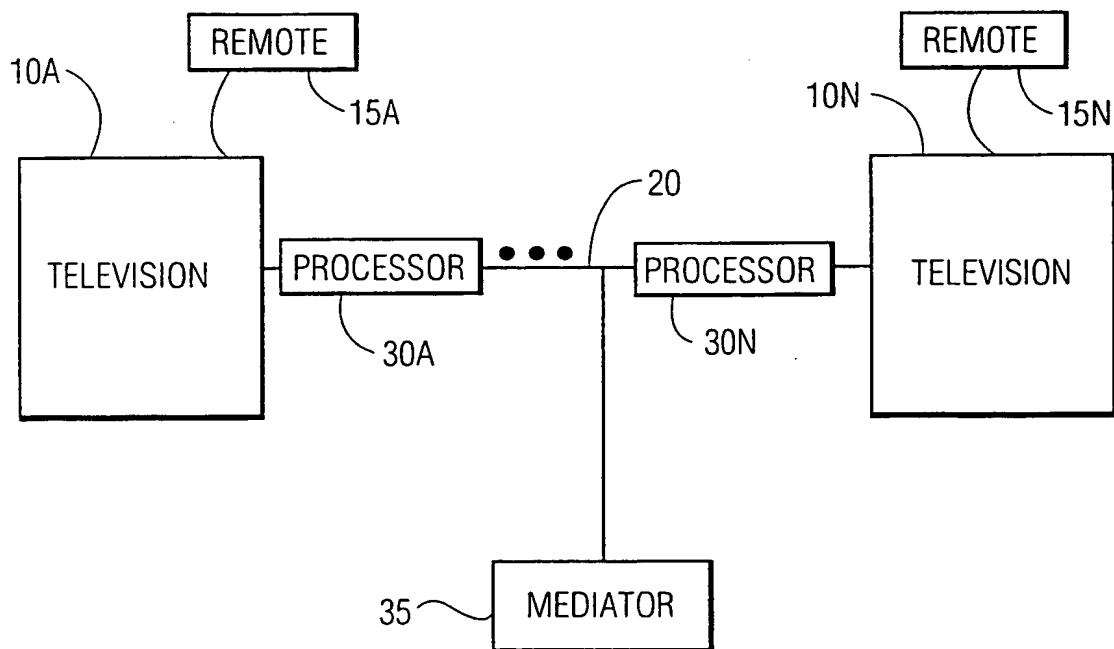


FIG. 2

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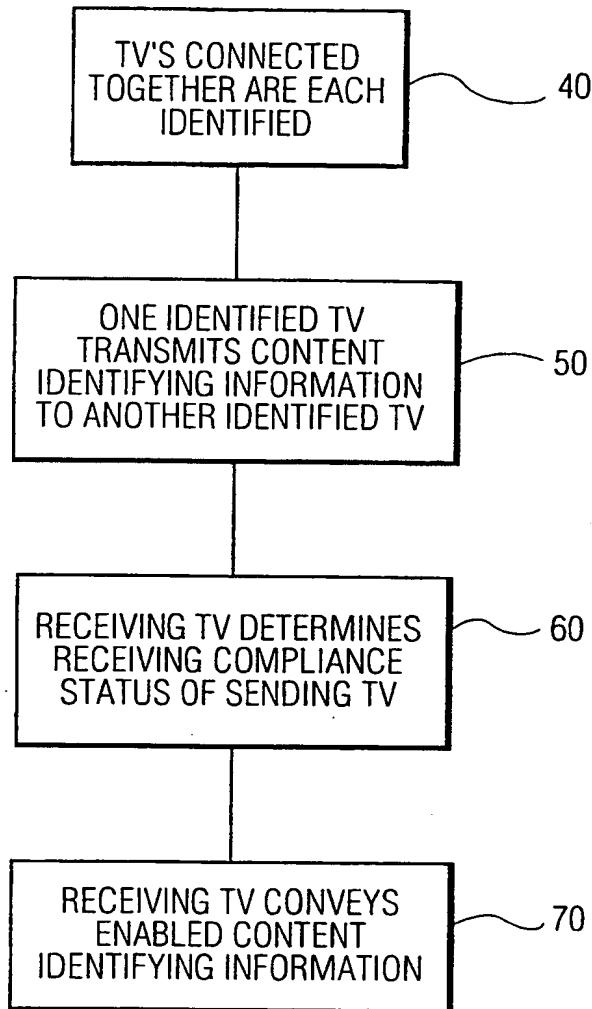


FIG. 3

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/12025

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 H04N5/445 H04N7/14 H04H9/00 H04N7/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04N H04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 996 008 A (GUTMANN MICHAEL J ET AL) 30 November 1999 (1999-11-30) column 3, line 29 -column 7, line 36 ---	1-14
Y	US 5 847 752 A (SEBESTYEN ISTVAN) 8 December 1998 (1998-12-08) column 2, line 16-33 column 8, line 49 -column 10, line 29 ---	1-14
Y	US 5 999 207 A (SIMERLY TIMOTHY W ET AL) 7 December 1999 (1999-12-07) column 3, line 66 -column 4, line 38 ---	1-14
A	EP 0 593 202 A (TAYLOR NELSON AGB PLC) 20 April 1994 (1994-04-20) column 2, line 13 -column 3, line 2 ---	1,6,12 -/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents:

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- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/12025

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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